

Bufo microtympenum Boulenger, 1882, a bufonid toad new for Nepal

(Amphibia, Anura, Bufonidae)

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A bufonid toad, *Bufo microtympenum* Boulenger, is recorded new for Nepal. It differs from its next relatives, *Bufo melanostictus* and *Bufo himalayanus*, in 5 characters (bony ridges on the head, tympanum, parotoids, relation of 1st and 2nd finger, dorsal skin). The question of hybridization between *B. melanostictus* and *B. himalayanus* is discussed and called in question for Nepal.

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Introduction

So far only three species of bufonid toads - *Bufo stomaticus*, Lütgen, 1862, *B. melanostictus*, Schneider, 1799, and *B. himalayanus*, Günther, 1864 - have been recorded from Nepal. The existence of a fourth species, the so-called hybrid between *B. melanostictus* and *B. himalayanus* mentioned by Nanhoe & Ouboter (1987) as well as by Späth (1992) is still unsubstantiated. 42 specimens of bufonid toads, present in the Zoologische Staatssammlung München and collected between 1961 and 1991 at different localities in central and eastern Nepal in altitudes between 1300 and 2500 m, were found to be different from *B. melanostictus* and *B. himalayanus*, but very similar to *B. microtympenum* described by Boulenger (1882) from Malabar (now Kerala) in South India and recorded by Kirtisinghe (1957) from Sri Lanka. However, these specimens from Nepal possess some additional characters not mentioned by previous investigators for the material from India and Sri Lanka. The Nepalese specimens show the following additional characters:

1. A thin suture like a vertebral line runs from snout to vent, it is more conspicuous in the large adult specimens.
2. A kidney-shaped thickened glandular structure with a tiny concentrated mass of warts on the inner margin of each parotoid.
3. Slightly developed parietal ridges.
4. Females are quite large, as large as 127 mm.

Boulenger (1882) did not mention these characters in the first description of the species *Bufo microtympenum*. However, the first three characters mentioned above could be seen clearly in the sketch of the species provided by him (Fig. 1).



Fig. 1. Dorsal view of *Bufo microtympenum*, as published by Boulenger (1882).

Materials and methods

The specimens were collected on different occasions in central and eastern Nepal, preserved in 65 % alcohol and stored in the Herpetological Section of the Zoologische Staatssammlung München. The collection sites are shown in Fig. 2.

Abbreviations used: ZSMH = Zoologische Staatssammlung München Herpetological Section.

Results and discussion

The collection data of the specimens examined are as follows: 1 ♂, Jiri, 2000 m, 28.5.1962, coll. J. Popp (ZSMH 243/1979); 24 ex. Waldcamp (forestcamp) Ghandrung, 2300 m, 16.5.1973, coll. Gruber & Fuchs (ZSMH 183/1973); 2 ♀ ♀, Waldcamp Ghandrung, 2300 m, 26.5.1973, coll. Gruber & Fuchs (ZSMH 244/1979); 1 ♂, Tatopani, 1300 m, 28.5.1973, coll. Gruber & Fuchs (ZSMH 185/1973); 2 ♀ ♀, Kalopani, 2450 m, 2.6.1973, coll. Gruber & Fuchs (ZSMH 192/1973); 3 ♀ ♀, 1 ♂, Kalopani, 2500 m, 3.6.1973, coll. Gruber & Fuchs (ZSMH 292/1979); 1 ♀, Kimpti Khola Those, Eastern Nepal, 1600 m, Oct. 1983, coll. Gruber (ZSMH 28/1983); 1 ♀, Nagarkot, Kathmandu, 2000 m, 28.7.1991, coll. Schleich (ZSMH without No.).

The specimens investigated show the following characters: Head with prominent, black, bony ridges, viz. a canthal, a preorbital, a supraorbital, a postorbital (in most of the specimens this ridge touches the parotoid), a short orbito-tympanic and a trace of parietal obliquely directed inwards. However, parietal ridges are not visible in the young specimens. In some young specimens the bony ridges are interrupted and only partially black. Snout short and blunt but less blunt than in *Bufo himalayanus*. Interorbital space broader than the upper eyelid; tympanum very small, always less than half the diameter of the eye; first finger extending beyond second, especially distinct in large specimens; toes about half webbed and with simple subarticular tubercle; two moderate metatarsal tubercles. When pressed forward along the body



Fig. 2. Collection sites of *Bufo microtympanum* material from Nepal in the Zoologische Staatssammlung München. ◆: site.

the tarsometatarsal articulation of the hindlimb reaches between the eye and the tip of snout. The large warty tubercles on the back tend to form two parallel rows on each side of the median line; the smaller warts on the upper surface are irregular, distinctly porous, black and spiny. Parotoids prominent, kidney-shaped or elliptic, shorter than head, twice and a half longer than broad. Coloration brown above and yellow beneath, marbled with brown. The measurements from the largest male and female specimens are given in Tab. 1.

Boulenger (1828) and Daniel (1963) have mentioned that *Bufo melanostictus* and *B. microtympanum* are very closely allied species and *B. microtympanum* differs only because of its small tympanum. But besides this we also found at least 5 more characters which separate both species from each other. Therefore we suspect that the so-called hybrid between *Bufo melanostictus* and *Bufo himalayanus*, mentioned by Annandale (1912), Nanhoe & Ouboter (1987) and Späth (1992), could be *Bufo microtympanum*. Our own investigations of 33 toad specimens from the Kali Gandaki-Annapurna-area, collected by Fuchs & Gruber in 1973 and kept in the Zoologische Staatssammlung Muenchen, proved that they are no hybrids between *B. melanostictus* and *B. himalayanus* but altogether *B. microtympanum*. It is difficult to understand why, according to those authors, only the Annapurna-Dhaulagiri-region should own a hybrid species and why it does not occur in other regions, where both "parental" species are sympatric. In Arun-valley, for example, we found in an altitude between 1400 and 1800 m *Bufo melanostictus* as well as *Bufo himalayanus* sharing common habitats, but we never observed the so-called hybrid between both these species.

Up to now we have not a single report of *Bufo himalayanus* from the Kathmandu-valley, a situation which is also mentioned by Dubois (1974). One specimen of *Bufo microtympanum*, examined by us, was collected from Nagarkot, Kathmandu-valley. As *Bufo himalayanus* is obviously absent from the Kathmandu-valley this specimen, besides showing clear characters of *B. microtympanum*, cannot be treated as a hybrid. So far the theory of hybrid nature has been based only on a few morphological characters shared by two distinct species. This cannot be satisfying for setting up a hybrid status as long as cytogenetic and electrophoresis investigations are lacking. Furthermore, Nanhoe & Ouboter (1987) and Späth (1992) mentioned

Tab. 1. *Bufo microtympanum*, Boulenger, body measurements in mm taken from the largest specimens.

	female mm	male mm
body length	127,0	73,0
head length	28,0	19,0
head width	38,0	23,5
interorbital space	13,0	9,0
tympanum	3,0	2,2
parotoid	22,3	12,2
lenth of tibia	41,5	29,4
foot- and tarsus-length	62,0	46,0
length of hand	30,1	20,0
length of foot	47,2	32,4



Fig. 3. Comparison of *Bufo microtympaanum* (left) and *Bufo himalayanus* (right) from the dorsal surface.

that the habitat of the so-called hybrid covers a rather short altitudinal space intermediate between the habitats of those two "parental" species. Our findings do not agree with this as *Bufo microtympaanum* has a wide range of distribution between 1300 and 2500 m. And there are at least 5 distinct characters by which these three species could be identified from each other as follows:

Bony ridges on the head:

B. melanostictus - distinctly elevated dark black; all bony ridges, except parietal ones, present.

B. microtympaanum - as in *B. melanostictus*, but no dark, black coloration in large specimens; traces of parietal ridges present (Fig. 3).

B. himalayanus - only low, blunt supraorbital ridges; without black coloration, but the same as dorsum (Fig. 3).

Tympanum:

B. melanostictus - very distinct; more than half or two thirds the diameter of the eye.

B. microtympaanum - small, less than half the diameter of the eye.

B. himalayanus - very small, hardly visible.

Parotoids:

B. melanostictus - mostly kidney-shaped, sometimes elliptic, smaller than head length.

B. microtympaanum - prominent; mostly kidney-shaped; twice and a half larger than broad (Fig. 3).

B. himalayanus - elongate, as long as head (Fig. 3).

Relation between first and second finger:

B. melanostictus - first finger extending generally, but not always, beyond the second.

B. microtympaanum - first finger always extending beyond the second, it is greatly extending in large specimens.

B. himalayanus - first finger not extending beyond the second.

Dorsal skin:

B. melanostictus - prominent, many dark brown or black spiny warts.

B. microtympaanum - same as in *B. melanostictus*, but spiny warts lesser and weaker (Fig. 3).

B. himalayanus - with distinctly porous warts, but they are fewer than in *B. melanostictus* and *B. microtympaanum*; skin is also comparatively smoother and shining (Fig. 3).

Zusammenfassung

Die bufonide Kröte *Bufo microtympaanum* Boulenger, 1882, wird zum erstenmal für Nepal nachgewiesen. Sie unterscheidet sich von ihren nächsten Verwandten, *Bufo melanostictus* und *Bufo himalayanus*, in den folgenden 5 Merkmalen: knöcherne Kämme auf der Kopfoberseite, Tympanumausprägung, Parotidenform, Beziehung zwischen 1. und 2. Finger, Beschaffenheit der Rückenhaut. Die Frage möglicher Hybriden zwischen *B. melanostictus* und *B. himalayanus* wird diskutiert und für Nepal in Zweifel gezogen.

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